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ABSTRACT

This paper investigates the extent to which American college/university faculty use cooperative pedagogical techniques in their classrooms, and identifies facilitating and inhibiting factors. A broad construct representing faculty's use of cooperative pedagogy was created, which places students at the center of the action regardless of class size and emphasizes interaction among students and between students and faculty. A survey of 35,478 full-time college and university faculty revealed that faculty use of cooperative pedagogy is best measured by a seven-item construct which includes the following items: cooperative learning (small groups), group projects, student presentations, class discussions, student-developed activities, student-selected topics, and student evaluations of each other's work. Analysis revealed that women used cooperative pedagogy more than men did, Blacks more than other ethnic groups, faculty from lower social classes more than other classes, lower academic rank more than higher, and those leaning toward teaching more than those more involved in research. Faculty members most likely to engage in cooperative pedagogy are likely to teach in education, fine arts, or English departments; are not likely to teach in the hard or soft sciences, history, or the humanities; and are more likely to teach at two-year colleges than four-year colleges or universities. (Contains 20 references.) (JDD)

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Defining the Teaching-Learning Function in terms of Cooperative Pedagogy: An Empirical Taxonomy of Faculty Practices

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This paper was presented at the annual meeting of the Association for the Study of Higher Education held at the Doubletree Hotel, Tucson, Arizona, November 10-13, 1994. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

Defining the Teaching-Learning Function in Terms of Cooperative Pedagogy: An Empirical Taxonomy of Faculty Practices

The positive and negative influences of students on one another's attitudes, values and overall experiences have been widely studied and clearly documented (Astin, 1977, 1993; Pascarella and Terenzini, 1991). Given that students influence each other in so many ways, it comes as no surprise that they can also learn a great deal from one another. Many are beginning to view peer interactions as a possible foundation for creating new pedagogical approaches that can increase students' intellectual curiosity while successfully promoting learning. A large body of literature investigating pedagogies which capitalize on peer interactions has thus emerged (Bouton and Garth, 1993; Bruffee, 1993; Cohen, 1986; Goodsell, Maher, & Tinto, 1992). This literature is largely concerned with the use of teaching techniques and classroom approaches that build upon students' natural affinity toward their peers. Specifically, this research informs educators about the efficacy of techniques that introduce what is known as "cooperative" or "collaborative" learning into the classroom.

The purpose of this paper is to investigate the extent to which American college and university faculty use cooperative pedagogical techniques in their own classrooms, and to identify variables which facilitate (or act as barriers to) such utilization. In addressing these questions, we acknowledge that most of the research on cooperative learning is confined to primary and secondary educational institutions, and is geared specifically for teachers at those levels. Much of this research never intended to include higher education within its scope. As a result, the paradigms forwarded in this literature must be applied to higher educational settings with great care. Without such care, one might develop a simplistic interpretation of the literature deeming cooperative pedagogy as simply the use of group projects or team work.

In our effort to assess the extent of faculty usage of cooperative pedagogy, we have necessarily challenged and gone beyond this constrained definition which we feel is inadequate for higher education. By elaborating upon definitions which stress how pedagogy influences classroom dynamics, a broader idea of what constitutes cooperative pedagogy (i.e., more than

simply using group projects) was developed. Acknowledging the interpersonal and power dynamics that exist within the college classroom, we created a construct representing faculty's use of cooperative pedagogy that is broad in nature. Much in line with suggestions made by Gamson (1994), our construction of cooperative pedagogy places students at the center of the action regardless of class size, and emphasizes the interaction between students (such as through cooperative assignments, student-peer evaluations of each other's work, and group or team projects) and between students and faculty (through student-selected topics, student-developed activities, and student-driven rather than faculty-driven class discussions). Using this construct as a measure, we explored the differences among various faculty groups' (e.g., men, women, faculty in different departments, faculty at various types of institutions, etc.) use of cooperative pedagogy in the classroom. These exploratory analyses guided the development of a model which helps explain what facilitates and prevents faculty usage of cooperative pedagogy.

Cooperative Learning Defined

According to Cohen (1994), the term cooperative learning is broadly defined, encompassing the terms "collaborative learning" and "group work". Specifically, cooperative learning involves students working together in a group small enough for everyone to participate on a clearly assigned collective task. Cohen sees this definition as task oriented and sociological in nature. Because of this, her definition of cooperative learning is concerned with the group process and the delegation of authority. Implicitly, the small group is described as the vehicle through which cooperative learning occurs. Explicitly however, Cohen focuses her attention on defining the conditions under which these small groups can be most effective. In doing so, Cohen rightfully chooses to explore cooperative learning in terms of the interactions between students within the small group.

Cohen's focus on personal interactions is a useful way of conceptualizing cooperative pedagogy in higher educational settings. Specifically, Cohen's approach opens the possibility of broadening the definition of cooperative pedagogy to include those things which, other than the assignment of students to peer groups, can influence interactions. It is this possibility that guided

our thinking and the development of a cooperative pedagogy construct appropriate for higher education.

Cooperative Pedagogy in the College Classroom

Pedagogy, loosely defined, is "the art of teaching". It is common for any artist to freely experiment and choose among a variety of media with the intent of finding one which he or she feels is best suited for communicating an idea. However, in the art of teaching, many of us feel that the variety of media by which we can communicate a message to our students is rather limited. Most teachers resort to a particular style of teaching, usually a lecture, that efficiently passes information on to students. By viewing teaching as a simply a method of communicating information to students, we unnecessarily commit ourselves to a passive exchange where students perceive the teacher as the purveyor of information, and themselves as merely the receptacles. This passive exchange discourages ownership of information, and except for the exceptionally motivated student, discourages the kind of interaction that any scholarly enterprise thrives upon.

In assessing the extent to which college faculty use cooperative pedagogy in the classroom, we purposely challenged the idea that cooperative pedagogy was simply the use of group projects. Furthermore, we pushed beyond the traditional conceptions of a passive pedagogy toward one that actively engaged both parties involved in the teaching-learning function—the students and the faculty. Therefore, because cooperation implies a collective effort, and because we have deemed necessary an active exchange of information and ideas, we have operationally defined cooperative pedagogy as the use of teaching techniques and classroom approaches that engage students and faculty in a collective effort to define, shape, and implement the educational process.

Measuring Faculty Use of Cooperative Pedagogy

The multidirectional exchange implicit in our conception of cooperative pedagogy allows students to interact with one another, as well as faculty to interact with students. This approach explicitly challenges the traditional power and authority structure inherent in the classroom by opening the possibility for faculty to view students as instrumental in creating, shaping, and implementing curricula while learning. In a broad sense, we view the college student as

developmentally able to work with students and faculty in a peer-like process, where learning is seen as a collective task that involves more than simply receiving information, but creating ways for understanding, communicating and using that information. We believe that faculty who engage in this type of teaching with their students will truly be practicing cooperative pedagogy. This thinking has guided our development of a construct which represents the extent to which faculty engage in cooperative pedagogy.

Data Source and Sampling

The survey used in this study was designed in conjunction with a national study of the outcomes of general education programs conducted by the Higher Education Research Institute (HERI). Development of this survey was funded in part by the Exxon Education Foundation. Items on the survey focused on how faculty members spend their time, how they interact with students, their preferred methods of teaching and examining students, their perceptions of various aspects of the institutional climate, and their primary sources of stress and satisfaction. Demographic and biographical information was also collected.

Letters of invitation were sent to nearly 2,500 institutions yielding a total of 432 institutions that agreed to participate in the survey. Of these, 40 were eliminated due to low response rates, leaving a sample of 392 institutions. The HERI staff determined that this sample represented every major type of institution in the landscape of American higher education. Specifically, these data represented faculty who work at four-year and two-year institutions, both public and private.

Of the 93,479 surveys mailed out, 51,574 usable surveys were returned, yielding a response rate of 55.2%. Weighting procedures were implemented in order to approximate as closely as possible the results that would have been obtained if all college and university faculty in all institutions had responded to the survey. Additionally, selection procedures insured that only full time faculty who teach undergraduates were included in the data. This selection procedure yielded a sample of 35,478 full-time college and university faculty (Astin, Korn, & Dey, 1991).

Selection of Cooperative Pedagogy Variables

Several items on the survey asked faculty to indicate in how many of their undergraduate courses they used any of a number of evaluation or instructional techniques or methods. Faculty responded on a scale ranging from "None" to "All". There were 26 items to which faculty responded. We selected items that best reflected our definition of cooperative pedagogy. Subsequently, exploratory factor analysis (EFA) was used as a means of data reduction. The EFA yielded three distinct factors, the first of which seemed most comparable to our conception of what would measure faculty use of cooperative pedagogy. In line with Nunnally & Bernstein (1994), we extracted the most conceptually defensible items from this first factor, and added others to create what we thought best represented the construct of "Faculty use of cooperative pedagogy". These items were then subjected to a series of confirmatory factor analyses (Jöreskog & Sörbom, 1988; Nunnally & Bernstein, 1994) yielding the measure shown in Table 1.

We believe that faculty use of cooperative pedagogy is best measured by a seven-item construct. Of these seven items, "Cooperative Learning (Group Projects)" is most descriptive of the overall construct (this item had the highest factor loading). Additionally, it can be seen that this construct included items that went beyond simply the usage of group projects. Specifically, items such as "Class Discussions", "Student-Selected Topics", "Student-Developed Activities", and "Student Evaluations of Each Other's Work" were all included to broaden the conception of cooperative pedagogy. The inclusion of these items allowed the measure to take into account pedagogical techniques or approaches that increase student participation in shaping the teaching-learning function. Table 1 depicts the results of an item analysis. This item analysis showed that each of the components making up this construct had a high correlation with the remaining items making up the construct (i.e., a high item-total correlation). The overall construct was deemed as internally consistent or reliable (Alpha = 0.77) based upon commonly accepted guidelines (Nunnally & Bernstein, 1994; Feldt & Brennan, 1993).

Methods and Results

Initially, we conducted a series of exploratory analyses to determine the characteristics of faculty members who use and do not use cooperative pedagogical techniques. We began by assessing the mean use of cooperative pedagogy for faculty using our seven-item scale. Specifically, this analysis was disaggregated by background characteristics (such as sex, age, race, and social class background), environmental or contextual characteristics (such as departmental affiliation and the type of institutions at which the faculty are employed), and various faculty activities or interests. This initial exploratory analysis brought to our attention variables that appear to influence the use of cooperative pedagogy, and provided a basis for including or not including a variable in our regression model.

Guided by Astin's (1991) approach to evaluating and assessing the impact of college on student outcomes, we then created a blocked stepwise regression model to predict use of cooperative pedagogy from a combination of variables which included faculty characteristics, contextual or environmental characteristics, and faculty activities. The variables selected for this model gained are further described below. Using a hierarchical approach, we created the regression model in an effort to determine (1) which variables were positively or negatively associated with the use of cooperative pedagogy, and (2) the relative importance of each variable in determining a faculty member's use of cooperative pedagogy.

Exploratory Analysis

We began by examining the background variables of sex, race, class, and age in an effort to understand the demographics of which faculty members use cooperative pedagogy. Table 2 shows the mean cooperative pedagogy score for faculty members, by sex. The results show a clear trend: women use cooperative pedagogical techniques more than men (the mean for women is 2.18, for men is 1.90). Because of this strong sex difference, we conducted all further analyses breaking down by sex. For the remainder of our analysis, this strong sex trend permeates. In every category we examined, women consistently show a higher mean score on the cooperative learning factor than men.

In Table 3, we find the mean score on the cooperative pedagogy factor, by race and sex. Women scored higher than men in each racial category. In general, Blacks scored higher than the

other ethnic groups. The highest scoring groups are Puerto Rican women, Black women, American Indian women, and Mexican American women.

The breakdown by social class and sex, found in Table 4, shows a slight trend that faculty from lower social classes tend to use cooperative teaching techniques more. Table 5 shows the breakdown by age and sex, where we see a clear trend for men, but not women. Younger men tend to use cooperative pedagogy more than older men. For women, there is no clear difference by age. Still, women in all age categories used cooperative pedagogy more than men.

Table 6 shows the mean score on the cooperative pedagogy factor, broken down by academic rank and sex. There is a distinct trend for both sexes: the higher the academic rank, the lower the usage of cooperative pedagogy. Again, women score higher than men in every category.

Table 7 is the beginning of our analysis examining cooperative pedagogical use by environmental characteristics. In Table 7, we find the mean scores on the cooperative pedagogy factor, broken down by type of institution where the individual faculty members teach. Again, women score higher than men in each category. For both sexes, cooperative learning is used most at four-year colleges (both public and private) and used least at private universities.

In Table 8 we examine the second and final environmental variable, the academic department in which the individual faculty members teach. Women score higher than men in each academic department. For both sexes, the lowest usage of cooperative pedagogy occurs in the hard sciences (math/statistics, physical sciences, biological sciences, and engineering). History/political science also registers a low score for both sexes. For both sexes, the top three departments for using cooperative pedagogy are education, English, and fine arts. The highest scoring separate groups are women in English, education, fine arts, agriculture, health-related, humanities, and business departments.

Table 9 is the beginning of our analysis of cooperative pedagogy, broken down by faculty activities and interests. In Table 9, we find the primary interests of individual faculty members. This is a four level variable, with the following possible responses: very heavily in teaching, leaning toward teaching, leaning toward research, very heavily in research. In all four categories, women

scored higher than men. For both sexes, the highest score is found in the category "leaning toward teaching," and the lowest score is in the category "very heavily in research."

Table 10 shows the mean scores broken down by the principle activities of faculty. The possible responses are: administration, teaching, research, and services to clients/patients. Women consistently score higher than men. For both sexes, the faculty who list their principle activity as research use cooperative pedagogy the least. Surprisingly, those faculty (both men and women) who list their principle activity as teaching show the second lowest score.

The number of publications accepted in the past two years is how the means are broken down in Table 11. Again, women show higher usage of cooperative pedagogy in every category. For women, there is a clear trend: the more publications women faculty produce, the more likely they are to use cooperative pedagogy. For men, the results are mixed, and there is no clear trend.

Table 12 shows the mean cooperative pedagogy score broken down by "teaching activities in the past two years." Women show a higher score in every category. For both sexes, the top four scores are in: taught an ethnic studies course, taught a women's studies course, attended a racial/cultural workshop, attended a minorities/women's workshop. The lowest score for both sexes was in the category "used intra- or extramural funds for research."

Regression Analysis

After initial exploratory analyses, those variables thought to affect the faculty use of cooperative pedagogy were identified and categorized as either input, environmental, or intermediate-outcome variables. As explained in Astin (1991), variables are entered into a regression equation in the proposed order in which they are believed to affect the dependent measure. Therefore, faculty characteristics such as gender and race, and other characteristics which help to define the faculty member such as social class background, constitute the first block to enter the model—the input block. Subsequent to the input block, variables that describe the faculty member's environment or context, such as the department with which the faculty member is affiliated, are entered in a block called the environmental block. Finally, variables that can be considered outcomes in and of themselves, occur prior to measurement of the dependent variable,

and directly or indirectly influence the dependent variable (e.g., certain activities engaged in by faculty), are entered as a block called intermediate-outcomes.

This procedure allows the impact of context or environment to be understood after controlling for various input characteristics; allows the activities faculty engage in to be assessed independent of background characteristics and the context or environment; and allows changes in the dependent measure (faculty use of cooperative pedagogy) to be evaluated at each successive stage in the model. Table 13 shows the variables used in this study, grouped in their appropriate blocks, along with each variable's simple correlation with the dependent measure and their respective regression coefficients (Betas).

From these regression results, we get a snapshot of which faculty members are likely to engage in cooperative pedagogy. Faculty who utilize cooperative pedagogical techniques are likely to be women, of a lower academic rank, relatively young, and Black, American Indian, Puerto Rican, or Mexican American. They are likely to teach in Education, Fine Arts, or English departments. They are not likely to teach in the hard or soft sciences, or in History or the Humanities. They are also unlikely to teach at a university or four-year college (meaning that they are likely to teach at two-year colleges.)

After having controlled for inputs and the environment, Table 14 summarizes the facilitators and barriers to faculty's use of cooperative pedagogical techniques. Basically, activities that foster personal interaction, that get faculty more involved with each other and with students, seem to facilitate the use of cooperative pedagogy. In addition, involvement in multiculturalism and women's issues appears to have a positive effect as well. And, faculty interest in teaching is a facilitator. The barriers to faculty use of cooperative pedagogy center around an emphasis on research.

Discussion

Perhaps the portrait painted above of which faculty are likely to use cooperative pedagogy should come as no surprise. Although cooperative pedagogical techniques have been used since time immemorial, they have recently gained in popularity in the United States. Usage has

increased in the past decades in primary and secondary schools, but now appears to be "trickling up" to post-secondary education. Because the conscientious use of cooperative pedagogy in higher education is still viewed as innovative and new, it is not surprising that those who use it are the "new guard" of younger faculty, who are very different demographically from the "old guard" of predominantly white male faculty.

There is one clear trend which is a little more surprising, and which requires more discussion—the fact that women faculty consistently use cooperative pedagogy much more than their male counterparts. This is true even after controlling for department, type of institution, age, rank, and other variables. Though women faculty of lower academic ranks use cooperative pedagogy more than those with a higher rank, there is no discernible trend by chronological age. Therefore, many questions come to mind. Why is it that women faculty, young and old, tend to use cooperative pedagogy more than their male colleagues? Is it possibly a result of the way women are socialized, to value relationships and interaction with other people, as the work of Carol Gilligan (1982) might suggest? Or is it possibly a by-product of the women's movement, which emphasized cooperation and collaboration over individualism?

Further research into this issue should elaborate upon the bimodal nature of teaching practices when comparisons are made between men and women—results which are replicated in much of the literature on faculty work and behavior (for a general discussion, see Finkelstein, 1984). Specifically, many questions regarding the implications of women's extensive use of cooperative teaching techniques need to be addressed. For example, much additional time and energy is involved in nurturing class interactions through cooperative pedagogy. Arguably, women who practice these techniques have a devotion to teaching which goes beyond that involved in simply lecturing. Given this greater investment of time and energy, do these women report any difficulties in other aspects of their scholarly careers? Is the departmental and institutional reward and promotion system structured to motivate these women to continue their progressive teaching styles? Also, do these women report any difficulties in obtaining recognition as legitimate scholars from their colleagues because of the emphasis they place on teaching?

The finding that the academic department in which faculty teach is a strong predictor of use of cooperative pedagogy seems plausible. Faculty who teach in the hard and soft sciences use cooperative pedagogy less often. Perhaps this is a result of the traditional lecture format that many science classes assume. Additionally, education, English, and fine arts, all departments which show the highest rates of faculty who use cooperative pedagogy, often have smaller, more interactive classes.

What is also interesting and perhaps more puzzling is the association between research orientation and use of cooperative pedagogy. The results of the regression analysis indicate that a strong research orientation (i.e., having primary interests which lie in conducting research rather than teaching) is a barrier to use of cooperative pedagogy. This makes sense given the popular academic paradigm which views research as being in opposition to teaching. However, we find strong evidence which indicates that faculty who balance teaching and research tend to use cooperative pedagogical techniques more often than those who simply do one or the other. Specifically, we see this in a few different ways. First, the number of writings accepted for publication in the past two years (loosely interpreted as research productivity) is a positive predictor of use of cooperative pedagogy. Looking back at Table 11, we see this is particularly true for women. Having a primary interest which leans toward research or lies heavily in research is a negative predictor of using cooperative pedagogy. Conversely, having a primary interest leaning toward (but not heavily in) teaching is a positive predictor. Therefore, faculty who have an interest in teaching (but not exclusively) tend to use cooperative pedagogy more.

The regression results concerning various faculty activities yields interesting results as well. For both men and women, activities concerning women's and minority issues, as well as multiculturalism, are all positive predictors of cooperative pedagogy usage. The other activities positively associated with using cooperative pedagogy (e.g., working with students on research projects, serving as a consultant, and team-teaching) all assume a willingness to engage in the type of personal interaction also necessary for engaging in our conception of cooperative pedagogy. Other positive predictors (e.g., taught an interdisciplinary course, a developmental/remedial

course, and/or an honors course) are all probably related to a willingness to test and innovative teaching techniques, of which cooperative pedagogy is certainly included. The only activity which is a negative predictor is teaching general education courses. This is understandable, given that so many of these types of courses tend to be taught in the traditional lecture format.

Our results suggest some policy implications. If we wish to encourage use of cooperative pedagogy, we might want to begin by finding incentives (via a revised reward structure) for faculty to do so. This challenge is particularly important in the hard and soft sciences, where cooperative pedagogy is used least often. Additionally, an institutional commitment to improving pedagogy might possibly include formal assistance for faculty who are unfamiliar or uncomfortable with progressive teaching techniques such as those encompassed within the rubric of cooperative pedagogy. Furthermore, for subject matter that is traditionally seen as less conducive to innovative pedagogical techniques such as those implied in our conception of cooperative pedagogy, more research and practical work needs to be done in order to create workable classroom models that faculty could successfully implement.

Our research also implies that getting faculty involved in ethnic, cultural, and women's issues (through attending workshops and teaching courses) would also help facilitate the use of cooperative pedagogy. This is probably because these types of activities immerse faculty in issues and topics that by their very nature invoke the types of interactions and discussions that are inherent to successful cooperative pedagogy. Although attending these workshops alone can not possibly account for any gains in faculty use of cooperative pedagogy, certainly the type of institutional culture necessary for the success of such workshops is related to the type of innovative and exploratory spirit needed to improve teaching.

Undoubtedly, there is also room for more theory-based work. The majority of cooperative pedagogy research is built around young children and adolescents. We must recognize the inability of these findings to generalize across all educational institutions—particularly to higher education. Without doubt, the enormous developmental differences between college students and the younger children studied in extant literature warrant a redirection of current cooperative learning paradigms.

We have made an initial attempt in this paper to do so. Much in the spirit of critical theory, with its emphasis on equalizing power and being inclusive, we have challenged the applicability of cooperative pedagogy as practiced in the primary and secondary grades to higher education. Specifically, by expanding the traditional roles of student and teacher in the college classroom, the often disparate concepts of teaching and learning become codependent, allowing the emphasis of education to be placed on the interactions.

We advocate an institutional approach to the improvement of teaching which begins with a serious look at what prevents quality teaching and innovation in the classroom. We believe future research should examine gender and racial differences in the use of cooperative pedagogy, to see what can be learned by the groups with the highest usage. Also, because little research has been conducted on cooperative pedagogy at the post-secondary level, a greater effort should be given to learning more about the effects of cooperative pedagogy on all participants, including the faculty who use it. A recent survey showed that college faculty overwhelmingly agree that being a good teacher is a top priority of theirs (Astin, Korn, & Dey, 1991). Therefore, we feel that a greater institutional investment (through resources and faculty promotion incentives) in teaching, and in improving teaching, will translate into faculty excitement and innovation.

References

Astin, A. W. (1977). Four critical years. San Francisco: Jossey Bass.

Astin, A. W. (1991). Assessment for excellence: The philosophy and practice of assessment and evaluation in higher education. New York: ACE/Macmillan.

Astin, A. W., Korn, W. S., & Dey, E. L. (1991). The American college teacher: National norms for the 1989-1990 HERI faculty survey. Los Angeles, CA: University of California at Los Angeles, Higher Education Research Institute.

Astin, A. W. (1993). What matters in college: Four critical years revisited. San Francisco: Jossey Bass.

Bouton, C., & Garth, R. (Eds.). (1993). Learning in groups. New Directions for Teaching and Learning, 14.

Bruffee, K. A. (1993). Collaborative learning: Higher education, interdependence, and the authority of knowledge. Baltimore, MD: Johns Hopkins University Press.

Cohen, E. G. (1986). Designing group work: Strategies for the heterogeneous classroom. New York: Teacher's College Press.

Cohen, E. G. (1994). Restructuring the classroom: Conditions for productive small groups. Review of Educational Research, 64(1), 1-35.

Dey, E. L. & Korn, W. S. (1994). Betaview (revised version). [Computer software]. Los Angeles, CA: Higher Education Research Institute.

Feldt, L. S. & Brennan, R. L. (1993) Reliability. In R. L. Linn (Ed.). Educational Measurement (3rd ed.). (pp. 105-146). Phoenix, AZ: The American Council on Education and The Oryx Press.

Finkelstein, M. J. (1984). The American academic profession. Columbus, OH: Ohio State University Press.

Gamson, Z. F. (1994, September/October). Collaborative learning comes of age. Change, 26(5), 44-49.

Gilligan, C. (1982). In a different voice: Psychological theory and women's development. Cambridge, MA: Harvard University Press.

Goodsell, A., Maher, M., & Tinto, V. (1992). Collaborative learning: A sourcebook for higher education. University Park, PA: Pennsylvania State University, National Center for Postsecondary Teaching, Learning, and Assessment.

Jöreskog, K. G. & Sörbom, D. (1988). Lisrel 7: A guide to the program and applications (2nd ed.). Chicago, IL: SPSS Incorporated.

MacGregor, J. & Matthews, R. S. (1994). The Challenge of Collaborative Learning: Creating bridges between communities [Review of the book Collaborative learning: Higher education, interdependence, and the authority of knowledge]. Change, 26(5), 52-53.

Nunnally, J. C. & Bernstein, I. H. (1994). Psychometric Theory (3rd ed.). New York: McGraw-Hill.

Pascarella, E. T., & Terenzini, P. T. (1991). How college affects students. San Francisco: Jossey Bass.

SPSS Incorporated. (1988). SPSS-X user's guide (3rd ed.). Chicago: IL: SPSS, Inc.

Wakai, S. T. (1993). Barriers to and facilitators of feminist pedagogy in college and university teaching. Unpublished doctoral dissertation, University of California, Los Angeles.

Table 1

Factor Loadings and Item Analysis of Cooperative Pedagogy Construct

"In how many of the undergraduate courses that you teach do you use:"	Factor Loading	Item-Total Correlation	Alpha if Item Removed
Cooperative Learning (small groups)	.76	.61	.72
Group Projects	.73	.56	.73
Student Presentations	.72	.56	.73
Class Discussions	.68	.41	.76
Student-Developed Activities	.59	.35	.77
Student-Selected Topics	.56	.45	.75
Student Evaluations of Each Other's Work	.50	.52	.74

Note: Alpha = .77
Each item was rated on the following scale: 1—None, 2—Some, 3—Most, 4—All.

Table 2

Mean Use of Cooperative Pedagogy, by Sex

	Mean/Standard Deviation
All Faculty (n = 384,155)	1.98 /.57
Men (n = 273,581)	1.90 /.54
Women (n = 110,573)	2.18 /.60

Notes:
n's are weighted
minimum = 1, maximum = 4

Table 3

Mean Use of Cooperative Pedagogy, by Race and Sex

Racial Group	Mean/Standard Deviation		
	All Faculty	*Men*	*Women*
African American (n = 14,835)	2.23 /.60	2.14 /.59	2.33 /.59
Puerto Rican (n = 1,471)	2.21 /.60	2.03 /.51	2.42 /.58
Mexican American (n = 2,959)	2.15 /.57	2.08 /.56	2.25 /.55
American Indian (n = 3,392)	2.13 /.60	2.05 /.54	2.30 /.67
Whites (n = 345,718)	1.97 /.57	1.89 /.53	2.17 /.60
Asian American (n = 11,648)	1.86 /.51	1.79 /.49	2.08 /.51

Notes:
n's are weighted
minimum = 1, maximum = 4

Table 4

Mean Use of Cooperative Pedagogy, by Social Class Background and Sex

	Mean/Standard Deviation		
Social Class Background	*All*	*Men*	*Women*
High (n = 62,033)	1.95 /.57	1.86 /.53	2.16 /.61
Middle (n = 81,112)	1.99 /.58	1.90 /.55	2.18 /.62
Low (n = 218,004)	1.98 /.56	1.90 /.53	2.18 /.60

Notes:

n's are weighted

minimum = 1, maximum = 4

High social class background means at least one parent received a graduate degree; middle means at least one parent received a bachelor's degree (but did not receive a graduate degree); low means neither parent attended college.

Table 5

Mean Use of Cooperative Pedagogy, by Age and Sex

	Mean/Standard Deviation		
Age Group	*All Faculty*	*Men*	*Women*
29 or less (n = 8,361)	2.00 /.59	1.94 /.63	2.05 /.56
30-34 (n = 30,988)	2.01 /.57	1.91 /.53	2.20 /.59
35-39 (n = 51,660)	2.05 /.58	1.94 /.52	2.22 /.63
40-44 (n = 66,507)	2.01 /.58	1.94 /.55	2.16 /.60
45-49 (n = 72,264)	1.97 /.57	1.84 /.52	2.20 /.61
50-54 (n = 59,926)	1.96 /.56	1.88 /.54	2.18 /.59
55-59 (n = 48,303)	1.93 /.55	1.86 /.53	2.19 /.57
60-64 (n = 31,172)	1.90 /.55	1.85 /.53	2.09 /.58
65-69 (n = 10,559)	1.90 /.57	1.84 /.54	2.15 /.60
70 or more (n = 1,730)	1.93 /.53	1.88 /.52	2.08 /.56

Notes:
n's are weighted
minimum = 1, maximum = 4

Table 6

Mean Use of Cooperative Pedagogy, by Academic Rank and Sex

	Mean/Standard Deviation		
Academic Rank	*All Faculty*	*Men*	*Women*
Professor (n = 128,507)	1.88 /.54	1.84 /.52	2.11 /.57
Associate Professor (n = 98,854)	1.98 /.56	1.92 /.54	2.18 /.59
Assistant Professor (n = 89,887)	2.03 /.58	1.93 /.53	2.21 /.61
Lecturer (n = 6,920)	2.16 /.62	2.09 /.64	2.23 /.59
Instructor (n = 51,050)	2.07 /.57	1.97 /.53	2.17 /.60

Notes:
n's are weighted
minimum = 1, maximum = 4

Table 7

Mean Use of Cooperative Pedagogy, by Type of Institution and Sex

	Mean/Standard Deviation		
Type of Institution	*All Faculty*	*Men*	*Women*
Public Universities (n = 95,786)	1.92 /.58	1.85 /.55	2.18 /.63
Public Four-Year Colleges (n = 99,995)	2.02 /.58	1.95 /.55	2.22 /.62
Public Two-Year Colleges (n = 70,525)	1.98 /.55	1.89 /.51	2.12 /.58
Private Universities (n = 34,930)	1.84 /.53	1.79 /.50	2.05 /.57
Private Four-Year Colleges (n = 67,282)	2.06 /.55	1.97 /.52	2.26 /.58
Private Two-Year Colleges (n = 3,644)	1.99 /.60	1.89 /.59	2.09 /.60

Notes:
n's are weighted
minimum = 1, maximum = 4

Table 8

Mean Use of Cooperative Pedagogy, by Academic Department and Sex

	Mean/Standard Deviation		
Academic Department	*All Faculty*	*Men*	*Women*
Education (n = 30,773)	2.29 /.60	2.21 /.58	2.39 /.61
English (n = 27,289)	2.26 /.58	2.11 /.53	2.48 /.57
Fine Arts (n = 31,266)	2.25 /.61	2.22 /.60	2.40 /.63
Health Related (n = 21,279)	2.12 /.55	1.87 /.48	2.20 /.54
Agriculture (n = 5,719)	2.03 /.49	2.01 /.48	2.24 /.53
Business (n = 31,563)	2.03 /.59	2.00 /.57	2.12 /.61
Humanities (n = 29,108)	1.96 /.50	1.88 /.46	2.15 /.53
Social Sciences (n = 43,897)	1.89 /.52	1.84 /.50	2.04 /.55
Engineering (n = 17,739)	1.78 /.43	1.77 /.42	1.90 /.57
History, Political Science (n = 20,812)	1.77 /.45	1.75 /.43	1.93 /.48
Biological Sciences (n = 20,374)	1.70 /.44	1.69 /.43	1.73 /.46
Physical Sciences (n = 24,578)	1.61 /.40	1.60 /.38	1.78 /.49
Math, Statistics (n = 22,334)	1.60 /.40	1.58 /.39	1.68 /.43

Notes:
n's are weighted
minimum = 1, maximum = 4

Table 9

Mean Use of Cooperative Pedagogy, by Primary Interest and Sex

"Do your primary interests lie in teaching or research?"	Mean/Standard Deviation		
	All Faculty	*Men*	*Women*
Very heavily in teaching (n = 141,109)	2.00 /.57	1.92 /.53	2.14 /.59
Both, but leaning toward teaching (n = 135,887)	2.04 /.57	1.95 /.54	2.26 /.60
Both, but leaning toward research (n = 91,294)	1.89 /.56	1.83 /.53	2.15 /.61
Very heavily in research (n = 14,464)	1.76 /.53	1.72 /.49	1.93 /.64

Notes:
n's are weighted
minimum = 1, maximum = 4

Table 10

Mean Use of Cooperative Pedagogy, by Principle Activity and Sex

	Mean/Standard Deviation		
Principle Activity	*All Faculty*	*Men*	*Women*
Services to Clients and Patients (n = 1,953)	2.19 /.67	2.15 /.66	2.24 /.68
Administration (n = 12,350)	2.13 /.59	2.06 /.57	2.32 /.60
Teaching (n = 342,544)	1.99 /.57	1.90 /.53	2.18 /.60
Research (n = 21,624)	1.74 /.50	1.73 /.49	1.83 /.53

Notes:
n's are weighted
minimum = 1, maximum = 4

Table 11

Mean Use of Cooperative Pedagogy, by Number of Publications Accepted in Past Two Years and Sex

Number of Publications Accepted in Past Two Years	Mean/Standard Deviation		
	All Faculty	*Men*	*Women*
None (n = 172,047)	2.00 /.57	1.91 /.53	2.16 /.59
1-2 (n = 96,570)	1.98 /.56	1.90 /.53	2.20 /.60
3-4 (n = 59,362)	1.94 /.56	1.89 /.54	2.14 /.59
5-10 (n = 11,648)	1.92 /.58	1.85 /.54	2.26 /.66
11-20 (n = 6,819)	1.97 /.61	1.95 /.58	2.32 /.78
21-50 (n = 1,598)	1.92 /.54	1.85 /.47	2.48 /.72

Notes:
n's are weighted
minimum = 1, maximum = 4

Table 12

Mean Use of Cooperative Pedagogy, by Activities in the Past Two Years and Sex

	Mean/Standard Deviation		
Activities in Past Two Years	*All Faculty*	*Men*	*Women*
Taught a Women's Studies course (n = 16,603)	2.27 /.58	2.11 /.53	2.33 /.59
Participated in Women's/Minorities workshop (n = 57,122)	2.21 /.58	2.13 /.56	2.32 /.59
Attended Racial/Cultural Awareness workshop (n = 90,539)	2.20 /.59	2.10 /.57	2.34 /.60
Taught an Ethnic Studies course (n = 20,248)	2.19 /.60	2.09 /.57	2.39 /.59
Team taught a course (n = 119,915)	2.08 /.58	1.99 /.55	2.27 /.59
Taught an Interdisciplinary course (n = 116,425)	2.07 /.56	2.00 /.53	2.26 /.59
Taught a Developmental/Remedial course (n = 48,092)	2.06 /.62	1.95 /.57	2.23 /.65
Served as a paid consultant (n = 159,716)	2.06 /.59	1.98 /.55	2.30 /.62
Worked with students on a research project (n = 219,359)	2.02 /.58	1.95 /.54	2.27 /.61
Held Faculty Senate or Council Office (n = 85,462)	2.02 /.57	1.94 /.54	2.22 /.60
Taught an Honors course (n = 59,712)	2.00 /.56	1.94 /.54	2.19 /.59
Taught a General Education course (n = 155,901)	1.99 /.57	1.91 /.53	2.20 /.61
Used intra- or extramural funds for research (n = 143,591)	1.95 /.56	1.89 /.53	2.17 /.61

Notes:
n's are weighted
minimum = 1, maximum = 4

Table 13

Summary of Regression for Variables Predicting Use of Cooperative Pedagogy

Variable	*r*	ß after inputs	ß after environment	Final ß
Inputs				
Sex (1 = "male", 2 = "female")	.22	.20	.14	.12
Rank (1 = "full professor")	.13	.06	.03	.07
Race: African American	.08	.05	.03	.03
Race: American Indian	.03	.03	.03	.02
Race: Asian American	-.03	-.04	-.03	-.02
Race: White	-.05	-.02	-.04	-.03
Race: Puerto Rican	.03	.01	.01	.01
Race: Mexican American	.02	.01	.01	.00
Social Class Background (1 = "low")	-.01	-.03	.00	.00
Age	-.08	-.03	-.04	-.02
Environmental/Departmental Affiliation				
Math	-.17		-.19	-.15
Physical Sciences	-.17		-.18	-.16
Biological Sciences	-.12		-.13	-.13
Education	.17		.10	.09
Fine Arts	.14		.09	.10
English	.15		.09	.08
History	-.08		-.10	-.10
Social Sciences	-.06		-.10	-.11
Engineering	-.07		-.07	-.09
Humanities	.00		-.04	-.03
Health-Related	.06		-.01	-.02
University	-.10		-.10	-.10
Four-Year College	.04		-.08	-.07
Institutional Control (1=public, 2=private)	.01		-.02	-.03
Faculty Activities and Interests				
Worked with students on research project	.10			.14
Attended racial/cultural awareness workshop	.21			.08
Served as a paid consultant	.12			.09
Taught an interdisciplinary course	.12			.06
Participated in Women's/Minority workshop	.18			.06
Team-taught a course	.13			.07
Taught a women's studies course	.13			.07
Taught a developmental/remedial course	.06			.03
Taught an ethnic studies course	.09			.03
Taught a general education course	.01			-.02
Taught an honors course	.01			.02
Held faculty senate or council office	.03			.01
Principle activity is research	-.10			-.03
Principle activity is administration	.05			.02
Primary interest leaning toward teaching	.08			.01
Primary interest heavily in research	-.08			-.04
Primary interest leaning toward research	-.08			-.03
Number of publications accepted	-.04			.02

Note: All Betas significant ($p < 0.0001$). R^2 = .06 after inputs; .19 after environment; and .26 for final solution.

Table 14

Facilitators and Barriers to Faculty's Use of Cooperative Pedagogy

Facilitators (in descending order of influence)

Worked with students on research project
Served as a paid consultant
Attended racial/cultural workshop
Team-taught a course
Taught an interdisciplinary course
Participated in women's/minorities workshop
Taught a women's studies course
Taught a developmental/remedial course
Taught an ethnic studies course
Taught an honors course
Principle activity is administration
Number of writings accepted in the past two years
Held faculty senate or council office
Primary interest leaning toward teaching

Barriers (in descending order of influence)

Primary interest heavily in research
Principle activity is research
Primary interest leaning toward research
Taught general education course